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(54) **HYDROGEL COMPOSITES AND SUPERPOROUS HYDROGEL COMPOSITES HAVING FAST SWELLING, HIGH MECHANICAL STRENGTH, AND SUPERABSORBENT PROPERTIES**

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(58) **Field of Search** 521/102, 109.1, 521/121, 125, 128, 130, 140, 142, 146, 149, 150, 182, 183, 186, 187

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(57) **ABSTRACT**

A superporous hydrogel composite is formed by polymerizing one or more ethylenically-unsaturated monomers, and a multiolefinic crosslinking agent, in the presence of particles of a disintegrant and a blowing agent. The disintegrant, which rapidly absorbs water, serves to greatly increase the mechanical strength of the superporous hydrogel and significantly shorten the time required to absorb water and swell. Superporous hydrogel composites prepared by this method have an average pore size in the range of 10 μm to 3,000 μm. Preferred particles of disintegrant include natural and synthetic charged polymers, such as crosslinked sodium carboxymethylcellulose, crosslinked sodium starch glycolate, and crosslinked polyvinylpyrrolidone. The blowing agent is preferably a compound that releases gas bubbles upon acidification, such as $NaHCO_3$. Improved hydrogel composites formed without a blowing agent are also provided.

40 Claims, 5 Drawing Sheets